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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,088	04/11/2005	Sakae Higano	Komatsu Case 311	9263

23474 7590 01/16/2007  
FLYNN THIEL BOUTELL & TANIS, P.C.  
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KALAMAZOO, MI 49008-1631

EXAMINER
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KYLE, MICHAEL J

ART UNIT	PAPER NUMBER
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3677

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/16/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/531,088

Applicant(s)

HIGANO ET AL.

Examiner

Michael J. Kyle

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 4/11/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 1 and 2 are objected to because in the last paragraph of each claim it is unclear to which action “the action” refers, and which abutting faces are referred to by “abutting faces”.

Are these abutting faces one of the abutting faces on the abutting cams?

2. Claims 1 and 2 are objected to because of the limitations “the fixed cam” and “the rotary cam” in the fourth paragraph of each claim. It is unclear if these limitations are referring to the cams in the rotary shaft or opening/closing shaft. Similar terminology is found throughout the claims.

3. Claims 1 and 2 are objected to because it is unclear if the limitation “the abutting cams” in the fifth paragraph refers to both pairs of abutting cams, or only one. As best understood it refers to both. However, only a single spring is claimed following this limitation.

4. Claims 1 and 2 are objected to because of the limitations “at the rotational action” and “the opening/closing action”. These limitations make the “actions” appear as a location, denoted by “at”.

5. Claims 1 and 2 are objected to because of the limitation “a rotational action” in the sixth paragraph of each claim. It is unclear if this is the same rotational action as recited previously in the claims.

6. Claim 2 is objected to because the first two lines read, “A two-shaft hinge equipped a rotation limiting mechanism”. This appears to be a typographical error.

7. Claim 3 is objected to because the limitation of “a width of an aperture thereof” is unclear. From the language, it appears “thereof” refers to the rotary shaft. However, it is unclear

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how the rotary shaft has a cross section such that an aperture of the rotary shaft would obstruct rotation of rotary shaft. Clarification as to what “thereof” refers to in the claim is required.

8. Claim 4 is objected to because of the limitation “or the like” in the last line of the claim. It is unclear if elements not actually recited in the claim are to be encompassed by the claim.

***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationships between the “rotation limiting mechanism” and the rest of the hinge. The rotation limiting mechanism is claimed largely in terms of its function. It is not clear, structurally, how the rotation limiting mechanism is implemented in the hinge, based on the claim language. For example, there are no structural elements to the rotation limiting mechanism claimed in the independent claims, nor is the relationship of where, structurally, this mechanism is provided. Where is it located relative to the rotation and opening/closing shafts? What structure provides the rotation limiting function? And how does it act on the claimed elements to provide such a function?

11. Claims 3-9 depend from rejected claim 1, and include all of the limitations thereof. For this reason, these claims are also rejected.

***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Kang et al (“Kang”, U.S. Patent No. 7,006,853). Kang discloses a two-shaft hinge that has a rotary shaft (130, 170) and an opening/closing shaft (110) and enables a rotational action and an opening/closing action, wherein the rotary shaft (130, 170) is inserted into the opening/closing (110) shaft by fitting the rotary shaft into a through hole (111) provided in a vertical direction with respect to a longitudinal direction of the opening/closing shaft. Kang also discloses a fixed cam (160, 320), a rotary cam (150, 330), and a spring (169, 340) are inserted into their respective rotary shaft and the opening/closing shaft. The fixed cams (160, 320) and the rotary cams (150, 330) abut by the spring force (from 169, 340). The abutting cams and the springs compose a torque unit that independently generates a sliding frictional torque at the rotational action and the opening/closing action. The rotational action of the rotary shaft is limited by a rotation limiting mechanism (117 and cam faces) depending on a rotational angle of the opening/closing shaft. It is noted that when the opening/closing shaft is in a fully closed position, the rotation shaft cannot rotate (column 2, lines 38-40 states the rotation occurs only after the folder is opened). The rotation limiting mechanism limits the action by abutting faces (of cams 160 to 150 and 320 to

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330) to limit at two locations (Each cam set) provided between the rotary shaft and the opening/closing shaft.

14. With respect to claim 2, Kang discloses a two-shaft hinge having a rotation limiting mechanism and a rotary shaft (150, 170) and an opening/closing shaft (110) that enables a rotational action and an opening/closing action. The rotary shaft (150, 170) is inserted into the opening/closing shaft (110) by fitting the rotary shaft into a through hole (111) provided in a vertical direction with respect to a longitudinal direction of the opening/closing shaft. Kang further discloses a fixed cam (160, 320), a rotary cam (150, 330) and a spring (169, 340) are inserted into each of the rotary shaft and the opening/closing shaft. The fixed cams (160, 320) and the rotary cams (150, 330) abut by the spring force (from 169, 340). The abutting cams and the springs compose a torque unit that independently generates a sliding frictional torque at the rotational action and the opening/closing action. The rotational action of the rotary shaft is limited by a rotation limiting mechanism (117 and cam faces) depending on a rotational angle of the opening/closing shaft. It is noted that when the opening/closing shaft is in a fully closed position, the rotation shaft cannot rotate (column 2, lines 38-40 states the rotation occurs only after the folder is opened). The rotation limiting mechanism limits the action by abutting faces (of cams 160 to 150 and 320 to 330) to limit at two locations (each cam set) provided between the rotary shaft and the opening/closing shaft.

15. With respect to claim 3, Kang discloses a rotation limiting groove (117) is formed in an area on a side of a drive body (the protuberances that move in 117).

16. With respect claim 4, Kang discloses the opening/closing torque mechanism (cams 320, 330) of the opening/closing shaft is arranged concentrated on one side (the right side, see figure 6) of an axial direction with respect to the shaft hole of the opening/closing shaft through which the rotary shaft passes, while the other side thereof constitutes a space region (119a).

17. With respect to claim 5, Kang discloses the opening/closing torque mechanism (320, 330) of the opening/closing shaft comprises units (321, 331) at two or more locations, said units generating a frictional torque by a repulsive force of the spring (340) at the abutting cam faces by abutting the rotary cam (330) capable of rotation and the fixed cam (320) that is movable in an axial direction (along 313) and rotates in unison with the opening/closing shaft and engaging the fixed cam and the rotary cam through the opening/closing shaft.

18. With respect to claim 6, Kang discloses a rotation limiting mechanism according where a range of rotation of the rotary shaft and the opening/closing shaft is limited by providing a stop mechanism (at ends of 117) for limiting the rotation and the opening/closing angle of the rotary shaft and the opening/closing shaft.

19. With respect to claim 7, Kang discloses that in order to generate a click action at a specified position during the rotational action and the opening/closing action of the rotary shaft and the opening/closing shaft, a mechanism that generates a click action is provided by providing a projection and recess on the fixed (160, 320) and the rotary cams (150, 330) constituted on the

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shafts for generating torque and abutment of the projection and recess of the fixed cam and the rotary cam. It is noted that both sets of cams have a projection and recess, which is all that is required by the claim to provide the "click action".

20. With respect to claim 8, Kang discloses the rotary shaft (150, 170) and the opening/closing shaft (110) respectively have a cross-section formed to be a cross-section other than circular at a sliding location of the fixed cam. The open/close shaft has a "C" shape, while the rotation shaft has two opposing "C" shapes separated by slots at the top and bottom. This allows the fixed cams (160, 320) to integrally rotate with the shafts while sliding.

21. With respect to claim 9, Kang discloses a bracket component (119b) is added on the opening/closing shaft (110) so as to dispose and fix the two-shaft hinge to an outer frame, and the hinge is fixed by the bracket. It is noted that the terminology "added" incorporates a method step into this product claim.

### ***Conclusion***

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references are cited to further show the state of the art with respect to two-axis hinges and multiple cam arrangements: Higano et al, Hsu, Kim, Satoh et al, and Jung et al.



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23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Kyle whose telephone number is 571-272-7057. The examiner can normally be reached on Monday - Friday, 8:30 am - 5:00 pm.

24. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Swann can be reached on 571-272-7075. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

25. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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**ROBERT J. SANDY**  
**PRIMARY EXAMINER**